ASSIGNMENT #1

SUBJECT & BASIC INFORMATION

- Write down the code of a C# program that performs Vigenere encryption/decription using the English alphabet for an entered password and message entered from the keyboard
  - The program has two main functionality: encryption and decryption
  - The program encrypts/decripts the message using the following Vigenere Cipher table given below:

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
B	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A
C	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B
D	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C
E	E	F	G	H	I	J	K	L	M	N	**O**	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D
F	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E
G	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F
H	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G
I	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H
J	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I
K	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J
L	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K
M	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L
N	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M
O	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N
P	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Q	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
R	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
S	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	**K**	L	M	N	O	P	Q	R
T	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
U	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
V	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
W	**W**	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
X	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Y	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Z	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y

- **CALCULATION OF THE ENCYPTED MESSAGE FOR AN EXAMPLE PASSWORD AND MESSAGE**
  - Rows of the table represent the letters of the password and colums of the table reprent the letters of the message
  - First row of the matrix is the letters of the English alphabet and the other rows should be assgined after calculation depending on the rule of the Vigenere table.
  - Let the message be “SAKARYA UNIVERSITY” and password “SWE”.
  - For example, for the first three letters of the message, the encrypted message is “KWO…”
  - If the length of the password is shorter than the message, it is repeated over and over throughout the message
  - If the message has space character(s), these char(s) is/are not be considered.

REQUIREMENTS

- Define a **ICrypt** interface and write necessary members necessary for the **CRYPT** class defined below.
- Define a **CRYPT** class
  - Do the necessary inheritance from **ICrypt**
  - Add message & password data members and a related properties for this class
  - Define a default constructor with no parameters
  - Define a constructor setting a valid message which is input from the keyboard
  - Write an encryption method named **encrypt()** that calculates the encrypted message depending on the Vigenere algorithm (depending on the ASCII codes of the letters)
  - Write an en decryption method named **decrypt()** that calculates the decrypted message depending on the Vigenere algorithm (vice versa of the encryption)
  - Write a **printEncryptedMessage()** method that prints the encrypted message on the screen
  - Write a **printDecryptedMessage()** method that prints the decrypted message on the screen
- Create an **input** object from the **CRYPT** class and call necessary functions in order to get the sample output screen below.

```
ENTER A PASSWORD...: SWE
ENTER A MESSAGE....:SAKARYA UNIVERSITY
-----------------------------------------
PASSWORD             : SWE
MESSAGE              : SAKARYA UNIVERSITY
-----------------------------------------
ENCRYPTED MESSAJE    : SWOSNCS QRARIJOMLU
DECRYPTED MESSAGE    : SAKARYA UNIVERSITY
-----------------------------------------
```

RULES & EVALUATION

- All code should be included in a **single C# file (.cs)**
- The C# file should include this comment lines below at the beginning of the file

```
//**************************************************************************
//**                                                                      **
//**         STUDENT NAME.............:                                   **
//**         STUDENT NUMBER...........:                                   **
//**************************************************************************
```

- There should be comment lines for some operations (methods, sprecific calculations, etc.)
- **Deadline:** Control SABIS system
- A **honor-code page** should be prepared for each assignment
  - It should include a cover including student information (name, surname, number, lecturer, course name, ...)
  - At the end of the page, there should be an **'honor code'** signed by the student.
- You should upload **only your C# file (.cs) and honor-code page (in pdf format)** together before deadline.